

# SÉMINAIRE

## DES DOCTORANTS

Gabriele Dabbaghian: Assessing macroeconomic implications of lifestyle changes

### ABSTRACT

Current climate change mitigation scenarios focus on energy efficiency and technological innovations to achieve the 2°C target. However, concerns remain regarding persistent global inequalities and the predominant role of technologies that are not proven at scale and have potential negative side effects. Additionally, these scenarios impact negatively other planetary boundaries. Alternative scenarios have been recently explored. On one side, the sufficiency literature employs bottom-up technical models to establish the lowest energy demand required to reach decent living standards, yet it does not incorporate the economic effects of these shifts in consumption patterns. Conversely, the ecological macroeconomics literature produces post-growth scenarios assessing the financial stability of such novel pathways, but they do not enter into sectoral evolutions and environmental consequences. To address these gaps, we use a hybrid Integrated Assessment Model, Imaclim-R World, featuring a multi-region, multi-sector structure combining representations of physical stocks and flows with macroeconomic dynamics. We investigate six climate mitigation scenarios, compatible with limiting global warming below 2°C, combining three assumptions about labor productivity growth (SSP2, Regional convergence and Post-Growth) with assumptions on lifestyles (with or without sufficiency policies). The IMACLIM-R model structure enables a comprehensive understanding of sufficiency, encompassing physical aspects of energy and material reduction, as well as macroeconomic facets such as infrastructure needs and structural changes linked to evolving consumption patterns. Capturing these interconnections allow to assess the macroeconomic implications of such trajectories, including impacts on structural changes, labor markets, and trade considerations for all regions. Contrary to the SSP2 2°C scenarios that exhibits persistent inequalities between regions, the convergence and post-growth scenarios achieve the 2°C objective while significantly reducing income inequalities. Global energy demand is reduced and Carbon Capture and Storage (CCS) requirements are limited only when sufficiency measures are implemented. The resulting changes in consumption patterns and household income have profound effects on the structure of the economy and the labor market in all regions, leading to significant reallocations of jobs and activities between sectors. In the scenario combining post-growth assumptions and sufficiency measures, financial flows are sufficient for investments in low-carbon technologies deployment. However, the patterns of international financial flows as well as international trade are significantly different from the other scenarios as well as from historical trends. Overall, using a hybrid IAM facilitates the integration of ecological macroeconomic literature with sectoral energy analysis, providing insights into the macroeconomic implications of lifestyle changes.

[PHD PROJECT]

**WEDNESDAY JANUARY 24, 4:30-5:30 - MEETING ROOM + ZOOM**

ORGANIZERS: CLÉMENT BOYER, THIBAUT BRIERA, BERTILLE DARAN, SIMON JEAN & BAPTISTE PARENT